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How different types of piano training help children improve their rhythm and performance skills over 16 weeks

Submission date 24/02/2026	**Recruitment status** No longer recruiting	[_] Prospectively registered [_] Protocol
Registration date 24/02/2026	**Overall study status** Completed	[_] Statistical analysis plan [_] Results
Last Edited 24/02/2026	**Condition category** Other	[_] Individual participant data [X] Record updated in last year

Plain English summary of protocol

Background and study aims
This study looked at how different types of piano training can help children improve their rhythm and performance skills. It compared a new approach called Music Execution Rhythm (MER) training with traditional piano lessons and an active control group. The aim was to understand whether MER-based training offers added value for young learners over a 16week period.

Who can participate?
Children aged 6 years who already had some basic exposure to music and were receiving piano instruction could take part. Children with neurological disorders, motor impairments, or other conditions that might affect rhythm or piano practice were not able to join.

What does the study involve?
Participants were randomly placed into one of three groups: MERbased piano training, traditional piano instruction, or an active control group. They took part in regular piano practice over 16 weeks and completed performance assessments before and after the training period to measure rhythm accuracy and stability. Participation was voluntary, and children could stop at any time.

What are the possible benefits and risks of participating?
Possible benefits included improving rhythm, accuracy, and overall piano performance. The risks were minimal, as the study involved noninvasive educational activities similar to normal piano lessons.

Where is the study run from?
The study was run in South Korea.

When is the study starting and how long is it expected to run for?
The first and final enrolment took place on 1 March 2024. The training programme ran for 16 weeks, and study completion was recorded on 1 July 2024.

Who is funding the study?
Investigator initiated and funded

Who is the main contact?
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Contact information

Type(s)
Principal investigator, Public, Scientific

Contact name
None Eun woo Lee

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Study information

Scientific Title
Growth dynamics and added value of MER-based piano training: a 3-arm 16-week randomized controlled trial

Acronym
MER-RCT

Study objectives

Ethics approval required
Ethics approval not required

Ethics approval(s)

Primary study design
Interventional

Allocation
Randomized controlled trial

Masking

Open (masking not used)

Control
Active

Assignment
Behavioural / Educational intervention

Purpose
Educational skill acquisition and performance improvement

Study type(s)

Health condition(s) or problem(s) studied
Piano training

Interventions
This randomized controlled trial examined the effects of a Music Execution Rhythm (MER)-based piano training program over a 16-week period. Participants were randomly assigned to one of three groups: MER-based training, traditional piano instruction, or an active control condition. Participants were randomly assigned to one of three study arms using a computer-generated randomisation sequence with outcome assessors blinded to group assignment.

MER-based training group:
Participants received rhythm-centred piano training based on the MER framework, focusing on internal pulse regulation, bilateral coordination, and structured rhythmic pattern execution. Training was delivered over a 16-week period with regular supervised practice sessions.

Traditional instruction group:
Participants received conventional piano instruction emphasising note accuracy, repertoire-based practice, and teacher-led demonstrations, matched in duration and frequency to the MER-based training.

Active control group:
Participants engaged in standard music-related activities without structured rhythm-centred piano training, matched for contact time.

Intervention Type
Behavioural

Primary outcome(s)
1. Groove Stability Index measured using Standardized performance-based composite rating scale (Groove Stability Index) at Baseline (pre-intervention) and post-intervention (16 weeks)

2. Rhythm Accuracy measured using MIDI-based timing deviation analysis at Baseline and post-intervention

Key secondary outcome(s))
1. Transfer performance measured using Performance on untrained piano accompaniment tasks at Post-intervention

Completion date
01/07/2024

Eligibility

Key inclusion criteria
1. Learners receiving piano instruction with basic prior exposure to music
2. Ability to participate in regular piano practice sessions

Healthy volunteers allowed
Yes

Age group
Child

Lower age limit
6 years

Upper age limit
6 years

Sex
All

Total final enrolment
90

Key exclusion criteria
1. Neurological disorders
2. Motor impairments
3. Conditions that could interfere with rhythmic performance or piano practice

Date of first enrolment
01/03/2024

Date of final enrolment
01/03/2024

Locations

Countries of recruitment
Korea, South

Sponsor information

Organisation
Eun woo Lee (self sponsored)

Funder(s)

Funder type

Funder Name
Investigator initiated and funded

Results and Publications

Individual participant data (IPD) sharing plan

IPD sharing plan summary
Not expected to be made available